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**Notice of Allowability**

Application No.

10/598,863

Examiner

Hoang V. Nguyen

Applicant(s)

JEUNG, HA JAE

Art Unit

2821

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed on 9/13/06.
2. ☒ The allowed claim(s) is/are 1-4.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.


Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 9/13/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_



**HOANG V. NGUYEN  
PRIMARY EXAMINER**

*Examiner's Amendment*

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

2. The application has been amended as follows:

In the specification:

Page 1, line 1 of paragraph 1, after "This application", insert - - is a 371 of PCT/KR05/01983 dated 6/24/2005 and - -.

Cancel claim 4 and replace insert the following:

"4. A front directional array antenna used in a wireless communication system, comprising:

a plurality of front direction antenna elements having a broad width of greater than  $\lambda/8$  as a width of a small dipole element and coupling a front directional element to have front directional characteristic and non-interference characteristic between the neighboring elements; a reflecting panel for plane-arranging and fixing the plurality of antenna elements at a height H of less than  $\lambda/4$  in column (x) and row (y) and having a corner reflecting portion which has a reflecting curvature of 20 to 60 degree which has a similar height to a height that the antennal element is fixed to adjust balance of emission pattern between the antennal elements located on both edge ends;

an x-axis series distribution portion applying a series distribution according to the binomial

distribution to form a zero point for a short axis (x) in which the number of element arrangement is small among the antenna elements arrange and fixed in column and row; a y-axis series distribution portion applying a series distribution according to Chebyshev function with respect to a long axis in which the number of arrangements is great to the signal of the x-axis series distribution portion to form a zero point for the y-axis; and an input-output portion outputting a combination signal of the y-axis series distribution portion to the external portion.”

The examiner’s amendment was done in order to delete the reference numbers in the claim and add continuing data in the specification.

***Allowable Subject Matter***

3. Claims 1-4 are allowed.

4. The following is an examiner’s statement of reasons for allowance:

Regarding claim 1, none of the prior art of record, either taken alone or in combination, fairly teaches or suggests, a method for designing a front directional array antenna comprising an analogous pattern element arranging step; a reception balancing step; an x-axis direction signal suppressing step; a y-axis direction signal suppressing step; and a back-suppressed sold pattern outputting step as claimed.

Claims 2 and 3 are allowed for depending on claim 1.

Regarding claim 4, none of the prior art of record fairly teaches or suggests, either taken alone or in combination, a front directional array antenna used in a wireless communication system comprising, in combination with other limitations, a plurality of front direction antenna elements having a broad width of greater than  $\lambda/8$  as a width of a small dipole element; a

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reflecting panel for plane-arranging and fixing the plurality of antenna elements at a height  $H$  of less than  $\lambda/4$  in column (x) and row (y) and having a corner reflecting portion which has a reflecting curvature of 20 to 60 degree which has a similar height to a height that the antenna element is fixed to adjust balance of emission pattern between the antennal elements located on both edge ends; and a y-axis series distribution portion applying a series distribution according to Chebyshev function with respect to a long axis in which the number of arrangements is great to the signal of the x-axis series distribution portion to form a zero point for the y-axis.

5. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- US 5,909,195 discloses an array antenna having dipoles arranged on a reflecting plate.
- US 6,339,407 discloses radiator modules located in front of a reflector.
- US 6,943,732 discloses a two-dimensional antenna array.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoang V. Nguyen whose telephone number is (571) 272-1825.

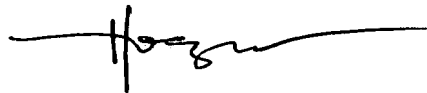
The examiner can normally be reached on Mondays-Fridays from 8:00 a.m. to 4:00 p.m..

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas Owens can be reached on (571) 272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

8. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hvn  
10/22/07



HOANG V. NGUYEN  
PRIMARY EXAMINER